

**DISCRETE MATH HOMEWORK: PROBABILITY,  
COMBINATIONS, PERMUTATIONS**

MR. FORTIER

- (1) Which is larger  $C(10, 2)$  or  $C(10, 8)$ ?
- (2) *a.* Find the sum of all possible combinations of four things. That is Find  $C(4, 0) + C(4, 1) + C(4, 2) + C(4, 3) + C(4, 4)$ .
- b.* Find the sum of all possible combinations of Three things. That is Find  $C(3, 0) + C(3, 1) + C(3, 2) + C(3, 3)$ .
- c.* Find the sum of all possible combinations of five things. That is Find  $C(5, 0) + C(5, 1) + C(5, 2) + C(5, 3) + C(5, 4) + C(5, 5)$ .
- d.* On the basis of your results, make a guess about the sum of all possible combinations of six things. Describe any pattern you noticed.
- (3) In this lesson the number of all-boy four-person committees on the Central High student council was calculated as  $C(8, 4) = 70$ , the number of all girl four-person committees was calculated as  $C(9, 4) = 126$ , and the number of four-person committees that are half boys and half girls was calculated as  $C(8, 2) \times C(9, 2) = 1008$ .
- a.* How many four-person committees consist of three girls and one boy?
- b.* How many four-person committees consist of one girl and three boys?
- (4) Ms. Howe is giving a ten-question true False quiz today. Darrel has just left her class and bumps into his friend Carla and informs her that the quiz was easy and that there were only four questions that were false.
- a.* When Carla takes the quiz, in how many ways can she select four

questions to mark false?

*b.* In how many ways can Carla select six questions to mark true?

*c.* In how many ways can Carla fill in the quiz if she ignores Darrel's hint?

(5) A Standard deck of cards contains 13 different cards from each of the four suits: spades and clubs, which are black in color, and diamonds and hearts, which are red in color.

*a.* In how many ways can 2 cards be dealt from a standard 52 card deck?

*b.* In how many ways can 2 red cards be dealt from a standard 52 card deck?

*c.* What is the probability that 2 cards dealt from a standard 52-card deck are both red?